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Abstract

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13. Abstract (Maximum 200 words).

The spatial and temporal variations of the geomagnetic field component annual means have been analyzed. The data consist of the annual means of the vector magnetic field components measured at magnetic observatories widely distributed about the Earth. The data are for the time interval 1910-1932. A principal objective of this research has been the separation of fields of internal from external origin.

(see attached sheet)

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A spherical harmonic model in geomagnetic coordinates consisting of all internal terms through degree nine and odd zonal external terms through degree seven was fit to the first differences of the magnetic observatory annual mean data for each year from 1911-1983. The method of stochastic inversion was used to determine the spherical harmonic coefficients. The observatory data were weighted in accordance with estimated rms errors for each field component at each observatory. The accuracy of the model was estimated as a function of geographical location, the model accuracy is best for Europe where there is a high density of magnetic observatories with generally high quality data.

Geomagnetic jerks are evident in graphs of the secular variation of the internal source field against time. Especially prominent jerks occurred at about 1925, 1940, 1969 and 1978. The worldwide character of the jerks of 1969 and 1978 is demonstrated. Evidence of internal source fields with less than ten year periods is presented. These fields would interfere with attempts to determine deep mantle conductivity.

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